BAG WITH MESH WALL PORTION

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BACKGROUND OF THE INVENTION

In Recchia U.S. Application Serial No. 09/481,211, a bag is provided which is suitable for the storage of onions and other products, where a high degree of open ventilation is necessary or desired, while such a bag may be made on an automated process line from rolls of plastic material.

This bag has one wall which is substantially a plastic sheet, while the other wall is primarily made of a mesh of plastic. A header portion is provided at one end from a folded end of the plastic sheeting of the bag, to provide a small section where opposed, opening-free plastic sheeting is provided on both sides.

By this invention, a similar bag is disclosed which has a mesh window and exhibits the advantage of providing a large degree of air ventilation to its contents, while at the same time the bag may be formed and filled on conventional bag-making equipment that is presently available.

DESCRIPTION OF THE INVENTION

By this invention, a bag is provided for containing produce and the like. The bag comprises a solid-wall, first thermoplastic sheet and a second mesh sheet, which sheets are sealed along opposed side edges to define a bag interior. The bag also defines a first transverse seal line between the first thermoplastic sheet and the mesh sheet. The first transverse seal line is spaced from the ends of the bag, and extends across the width of the bag.

A first end of the bag comprises the first thermoplastic sheet, which sheet is folded over to define a pair of wall portions, with one of the wall portions typically ending adjacent to the first transverse seal line where it is sealed to the mesh sheet. Thus, the mesh sheet is spaced from the one bag end, which bag end is defined by folded portions of the first thermoplastic sheet.

A second transverse seal line is positioned between a second thermoplastic sheet and the mesh sheet, the second seal line being adjacent to the end of the mesh sheet which is opposed to the first seal line. The second seal line also extends across the width of the bag. The first thermoplastic sheet extends from the first end of the bag, along the mesh sheet, and beyond the opposed end of the mesh sheet, to lie against the second thermoplastic sheet, to optionally permit formation of a third transverse closure seal between the first and second thermoplastic sheets, which third transverse seal is typically spaced from the mesh sheet. Alternatively, the bag may be gathered together near second seal line 30 with a bunching member such as a wire tie, hog ring, or the like to provide closure.

Thus, a bag is provided having solid plastic sheet ends, and a central portion which comprises at least one wall having mesh sheet, and the other wall comprising a portion of said first thermoplastic sheet.

Such a bag, having exclusively solid plastic sheeting ends which are spaced from a central mesh wall, can be both manufactured and filled on conventional bag forming and filling machinery, such as Lockwood Mfg. Co. or Volmpack Machines.

Also, a third thermoplastic sheet may be joined to the first sheet and the mesh sheet by the first seal line. The third sheet is typically positioned inside of the mesh sheet, while the first sheet is positioned outside of the mesh sheet in the area adjacent to the seal line. This third sheet can provide added plastic material to strengthen the bonding strength of the seal

line between the mesh sheet and the first sheet, to make it possible for the bag to carry a substantial weight of onions or other produce, or materials such as ice. The third sheet is typically substantially smaller than the first sheet or the second sheet.

Thus, a bag is provided which can carry a large mesh sidewall portion for extra high ventilation of the contents of the bag. Also, the bag can be manufactured by conventional, retrofitted form and fill machines out of rolls of plastic sheeting and the mesh material, preferably making use of the particular heat seal die disclosed in the above cited Patent Application 09/481,211.

DESCRIPTION OF DRAWINGS

Fig. 1 is a perspective view of the bag of this invention.

Fig. 2 is a longitudinal sectional view of the bag of Fig. 1, shown along lines 2-2 of Fig. 1, with the filled, sealed bag shown in broken lines.

DESCRIPTION OF SPECIFIC EMBODIMENTS

Referring to the drawings, a bag 10 is shown having a plastic mesh sheet 12 as part of its sidewall. Plastic mesh sheet 12 is sealed at its side edges 14 to corresponding side edges of a first thermoplastic sheet 16 to define bag interior 18. The mesh sheet may be of woven or nonwoven type.

Bag 10 also defines a first transverse seal line 20 between first thermoplastic sheet 16 and mesh sheet 12, with seal line 20 being spaced from the respective ends 22, 24 of bag 10, and positioned at or near the respective ends 13,17 of mesh sheet 12 and first thermoplastic sheet 16. First seal 20 extends across substantially the entire width of bag 10 to define a sidewall comprising a portion 26 of first sheet 16, connected to mesh sheet 12. First sheet 16 is folded over at end 22 so that first sheet portion 26 is continuous and integral with the remainder of first thermoplastic sheet 16, so that first thermoplastic sheet 16 and mesh sheet

14 together form a complete portion of bag 10 having a closeable interior 18, as particularly shown in Fig. 2. The bottom portion of bag 10 is formed by wall portion 26, facing another wall portion 28 of the first sheet 16. Thus, because of this foldover structure of first sheet 16, first seal line 20 is spaced from the one bag end 22, as well as the other bag end 24.

A second transverse seal line 30 is provided between a second thermoplastic sheet 32 adjacent to the end 34 of mesh sheet 12, which is opposed to first seal line 20. Second seal line 30 also extends across the width of bag 10, so that second thermoplastic sheet 32 forms an extension of the bag wall which comprises mesh sheet 12, as particularly shown in Fig. 2.

First thermoplastic sheet 16 extends beyond opposed end 34 of mesh sheet 14 and also second seal line 30, so that an end portion 36 of first thermoplastic sheet 16 can lie against second thermoplastic sheet 32, forming an end portion of the bag which comprises a pair of aperture-free thermoplastic sheets. Thus, the bag of this invention may comprise a closed bag, sealed on three sides but with an open upper end 40. Such a bag may be filled with onions 42 or any other desired item. Then, the bag may be gathered into a bunched-up neck 43, by a wire tie, hog ring, or the like as indicated by arrows 45 for bag closure, as shown in the broken line portion of Fig. 2. Alternatively, a third transverse seal 44 may be imposed as shown between second sheet 32 and sheet portion 36 to form a strong seal line. Either way, the contents of bag 10 are sealed, but with a large source for air exchange being provided by the area of mesh sheet 12, so that the contents of the bag, although sealed, may remain well ventilated.

Additionally, a third thermoplastic sheet 46 may be added within bag 10, inside and in contact with mesh sheet 12. The third thermoplastic sheet 46 may participate in the formation of first heat seal 20 as desired, to provide more plastic material to the heat seal, surrounding the strands of the mesh sheet 12 to provide greater strength to seal line 20. Third

sheet 46 can be seen to be much smaller than first sheet 16 or second sheet 32, being typically no larger than is desirable for convenient placement of the third sheet for strengthening seal line 20 by providing plastic to the seal. The mesh sheet 12 is preferably sandwiched at seal line 20 between third sheet 46 and thermoplastic sheet portion 26. Then, after bag 10 has been filled, third seal line 44 may be formed in a conventional manner between second sheet 32 and sheet portion 36 at the upper bag end, or a bunching member 45 such as a hog ring is used.

Mesh sheet 12 is made, as is conventional, of crossing plastic strands which adhere to each other at junction points. The particular crossing strands preferably comprise one set of parallel strands 50 that are perpendicular to the side edges 14 of bag 10. The reason for this is that the bag of this invention may be made on a suitably modified conventional form and fill machine currently known to the art. Strands 50 prevent stretching of the mesh sheet on the process line. The bag materials start as sheets of plastic and mesh on rolls. The rolls are advanced in the direction of parallel strands 50 along the process line, with first thermoplastic sheet 16 having one side rolled up to form folded sheet portion 26. Then, first and second seal lines 20, 30 are formed on the advancing sheeting, with second sheet 32 being also advanced on a continuous basis from a roller. Third sheet 46 may also be similarly advanced from a roller on a continuous basis when used, so that the assembly shown in Fig. 2 with first and second seal lines 20, 30 is formed, with continuous advancement in the direction of strands 50. The side heat seals 14 may be added at another station, either before or after the first and second seals 20, 30. The product 42 may be inserted into each bag after formation of the side seals 20, 30, and the third seal line 48 may then be formed or a hog ring applied, providing a sealed bag with high ventilation.

If desired a second mesh wall may be placed opposite to mesh sheet 12 in the first thermoplastic sheet 16, to provide a second window for the bag, with the bag being manufactured in otherwise similar manner.

Examples of mesh sheeting which may be used for purposes of this invention comprise a variety of commercially available plastic mesh materials, or metal strand mesh if desired. Typically the mesh sheet and the first, second and third sheets may be made of polyethylene or the like. For example, the mesh material may comprise CLAF® cross-laminated fiber material. A preferred mesh for sheet 12 comprises three sets of nonwoven parallel strands, angularly spaced from each other by 60 degrees, and secured together at common junction points.

Any portion of thermoplastic sheets 16 and 32 may carry printing, so that the bag may be identified on both sides.

Thus, a bag is provided having high ventilation characteristics, which bag can be produced on conventional form and fill machinery with relatively small modification, for automated manufacture and filling, having ends made of abutting plastic sheeting walls.

The above has been offered for illustrative purposes only, and is not intended to limit the scope of the invention of this application, which is as defined in the claims below.